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**A particle-based model for cell mechanics** S. MAJID HOSSEINI, Department of Chemical and Biological Engineering,University of British Columbia, Vancouver, Canada, JAMES J. FENG, Department of Chemical and Biological Engineering and Department of Mathematics, University of British Columbia, Vancouver, Canada — We present a particle-based model for red blood cells (RBCs) using the concept of smoothed particle hydrodynamics. The discrete nature of the model allows us to go beyond the continuum framework to probe changes in mechanical properties of cells as a function of its internal microstructural components. The RBC cytoplasm and the blood plasma are treated as Newtonian liquids, for which the Navier-Stokes equations are discretized by smoothed particles. The cell membrane incorporates two sets of elastic springs, one for stretching and the other for bending. Areal incompressibility is approximated by making the stretching springs follow the Skalak law. To test the mechanical behavior of such a particle-spring "cell," we compute RBC motion and deformation in a capillary. 2D results are in very good agreement with previous numerical and experimental studies.

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